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| Nota di contenuto | Contents; Contributors; Preface; Current books of interest; 1: Overview of Biogenesis and Applications of MicroRNA; Introduction; Mammalian microRNA biogenesis; Regulation during normal and potentially pathogenic microRNA biogenesis; Harnessing the RNAi pathway for gene silencing; Augmenting and antagonizing microRNA function; MicroRNA targets as gene regulators and sensors; MicroRNAs as prognostic and diagnostic markers; Conclusion; 2: Non-canonical MicroRNA Biogenesis and Function; Canonical microRNA biogenesis and function; Other small RNA biogenesis pathways<br>Non-canonical microRNA biogenesisOther RNA modifications; Non-canonical microRNA function; Concluding remarks; 3: Non-coding RNAs and the Epigenetic Control of Gene Expression; Long non-coding RNAs epigenetic regulators in human cells; Disruption of long antisense ncRNA networks; The therapeutic potential of targeting antisense ncRNAs; Issues with using small antisense ncRNAs therapeutically; 4: From Mice to Men: Towards the Clinical Translation of MicroRNA Technologies for Somatic Cell Reprogramming; Introduction; General evidence for a role of miRNAs in pluripotency and differentiation Strategies for the identification of pluripotency-associated miRNAsDelivery or expression of miRNAs as novel tools to improve reprogramming; MiRNA-based systems to monitor or control pluripotency and differentiation; Outlook: the road towards clinical |

translation of human iPSC technologies; 5: Systems Biology Tools to Understand the Role of Host MicroRNAs in Infection: a Closer Look at HIV; Background information; Systems biology tools to investigate differential miRNA expression in HIV infection; A high-content screening approach to evaluate the role of host miRNAs in HIV infection Conclusions and future prospects6: Synthetic MicroRNA Blocking Agents; Introduction; Anti-miR chemistries; Mechanisms of action and delivery of anti-miRs into cells; Validation of anti-miR activity in cells and assays; Therapeutic anti-miRs and in vivo delivery; MicroRNA sponges for suppression of microRNA activity; Target protectors for inhibition of microRNA-induced mRNA degradation; MicroRNA mimics; Prospects; 7: Exploiting MicroRNAs to Regulate Transgene Expression; Introduction; Using microRNAs avoid immune response to transgene product after gene transfer
Using microRNA to improve cell specificity and escape side-effect of gene transferNovel type of expression system using microRNAs; Conclusion; 8: Use of Artificial MicroRNAs for Gene Silencing; Introduction; Evolution of artificial miRNA as therapeutic agents; Application of amiRNA; Challenges using amiRNAs as therapeutic agents; amiRNA progress to clinic; Conclusions; 9: Harnessing RNAi for the Treatment of Viral Infections; Introduction; RNAi to treat viral hepatitis; RNAi for respiratory viruses; RNAi for haemorrhagic fever viruses; Other viruses targeted by RNAi
RNAi for the treatment of non-viral infections

Sommario/riassunto

Since the discovery of RNA interference (RNAi) in 1998, research on the topic has advanced at an impressive pace. Small RNAs and, in particular, micro RNAs (miRNAs) play a fundamental role in gene regulation through the activation of RNAi. Detailed insights into the mechanisms of RNAi have led to an improved understanding of gene regulation in normal and disease states, and thereby enabled the exploitation of RNAi for a variety of applications. In this book, an international panel of RNAi experts critically reviews the most interesting advances in basic applied RNAi research, highlighting the